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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,735	02/06/2001	Todd P. Lukanc	50432-086	2371

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EXAMINER

LEVIN, NAUM B

ART UNIT PAPER NUMBER

2825

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,735

Applicant(s)

LUKANC, TODD P.

Examiner

Naum B Levin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-12 and 14 is/are allowed.
- 6) ☒ Claim(s) 1-3, 13 and 15 is/are rejected.
- 7) ☒ Claim(s) 4-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/4/01
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claims 1-15 are objected to:

the recitations of "size of the overlying metal line" is not clear to what applicants intend to mean.

2. Claims 3, 8, 12 and 14 are objected to:

the recitation of " 3 sigma via-to-metal size " is not clear to what applicants intend to mean.

3. Claim 4 is objected to:

the recitation of " one metal line does not impact " is not clear to what applicants intend to mean (electrically impact?).

4. Claim 5 is objected to:

the recitation of " a first group " is not clear to what applicants intend to mean.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eden et al. (US Patent 5,620,916).

5. As to claims 1, 13 and 15 Eden discloses method for improving via/contact coverage in an integrated circuit including:

(1), (15) A method/computer-readable medium bearing instructions for generating a circuit layout comprising (col.3, ll.54-56):

selecting at least one via that has at least one edge touching (covering/overlapping/contact area) an edge of an overlying metal line (col.4, ll.65-66; col.5, ll.12-18);

measuring (CAD tool is generally used by designers to aid in generating the initial layout, wherein all interconnect lines are spaced by at least minimum distance; whereby CAD tool is measuring distance between metal lines) a distance between the edge of the overlying metal line and an edge of an adjacent metal line (col.4, ll.35-44; col.4, ll.58-64);

if the distance between the touched edge of the overlying metal line and the edge of the adjacent metal line is at least a predetermined distance (minimum distance), then increasing the size of the overlying metal line (col.4, ll.35-44; col.4, ll.66-67; col.5, ll.1-11);

(13) An apparatus (computer system) for generating circuit layouts comprising:

a central processing unit (col.1, ll.33-45);

a display (col.1, ll.33-45); and

at least an input device (col.1, ll.33-45); wherein

the central processing unit (col.1, ll.33-45):

selects at least one via that has at least one edge touching (covering/overlapping/contact area) an edge of an overlying metal (col.4, ll.65-66; col.5, ll.12-18);

measures (CAD tool is generally used by designers to aid in generating the initial layout, wherein all interconnect lines are spaced by at least minimum distance; whereby CAD tool is measuring distance between metal lines) a distance between the edge of the overlying metal line and an edge of an adjacent metal line (col.4, ll.35-44; col.4, ll.58-64);

if the distance between the touched edge of the overlying metal line and the edge of the adjacent metal line is at least a predetermined distance (minimum distance), then increases the size of the overlying metal line (col.4, ll.35-44; col.4, ll.66-67; col.5, ll.1-11).

With respect to claims 1, 13 and 15 Eden lacks a method/apparatus/program in which if the distance between the touched edge of the overlying metal line (contact area) and the edge of the adjacent metal line is less than the predetermined distance (minimum distance), then increasing a size of the overlying metal line and decreasing a size of the adjacent metal line.

It would have been obvious to a person of ordinary skills in the art at the time the invention was made to employ Eden's teaching regarding the method/apparatus/program by employing CAD tool in which if the distance between the contact area of the overlapping metal line and the edge of the adjacent metal line becomes less than the minimum distance, then increasing the width of overlapping line

in the contact area in order to keep the minimum distance between increased size of the contact area and adjacent metal line according to the predetermined distance (predetermined minimum distance).

6. As to claims 2 and 3 Eden recites:

(2) The method according to claim 1, comprising increasing the size of the overlying metal line (contact area) in a vicinity of the via line (col.4, ll.35-44; col.4, ll.66-67; col.5, ll.1-11);

(3) The method according to claim 2, comprising increasing the size of the overlying metal line according to a 3 sigma via-to-metal size and positioning error factor for the technology embodied in the computer generated circuit layout (col.4, ll.11-30; col.5, ll.26-31).

Allowable Subject Matter

7. Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest or render obvious:

A method for generating a circuit layout comprising:

selecting at least one via that has at least one edge touching an edge of an overlying metal measuring a distance between the edge of the overlying metal line and an edge of an adjacent metal line;

if the distance between the touched edge of the overlying metal line and the edge of the adjacent metal line is at least a predetermined distance, then increasing the size of the overlying metal line; and

if the distance between the touched edge of the overlying metal line and the edge of the adjacent metal line is less than the predetermined distance, then increasing a size of the overlying metal line and decreasing a size of the adjacent metal line, wherein

decreasing the size of the adjacent metal line by an amount that accounts for the predetermined distance and a distance delta that is determined from evaluation of simulated and experimental measurements of a distance where one metal line does not electrically impact an adjacent metal line; and

increasing the size of the overlying metal line by an amount based upon evaluation of simulated and experimental measurements of a distance where one metal line does not impact an adjacent metal line.

8. Claims 8-12 and 14 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest or render obvious:

A method/apparatus/program for generating a circuit layout comprising:

determining a delta distance based upon simulated and experimental measurements of metal lines in the circuit layout such that a metal line reduced by at least the delta distance will not electrically impact an adjacent metal line that is increased by a second oversize;

determining the second oversize based upon simulated and experimental measurements of metal lines in the circuit layout such that increasing a metal line by the second oversize will not electrically impact an adjacent metal line that has been decreased by at least the delta distance;

selecting vias that do not fully contact a metal line based upon whether at least one edge of a via touches an edge of an overlying metal line, and grouping the selected vias into a first via group;

selecting vias in the first via group based upon whether a distance from the overlying metal line edge to an edge of an adjacent metal line is at least the minimum distance, and grouping these selected vias into a second via group;

increasing the size of the overlying metal lines that contact vias in the second via group by the first oversize;

increasing the size of metal lines that contact vias in the first via group that are not in the second via group by the second oversize; and

decreasing the size of adjacent metal lines to each overlying metal line touched by a via in the first via group that is not in the second via group by at least the delta distance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naum B Levin whose telephone number is 571-272-1898. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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VUTHE SIEK
PRIMARY EXAMINER